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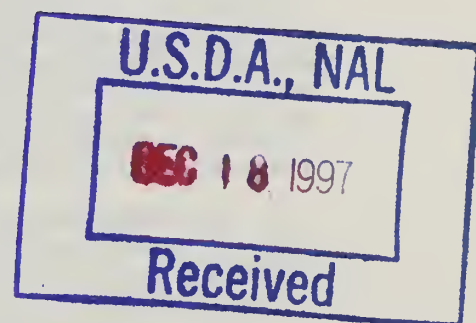


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INVENTORY OF BENEFITS, COSTS AND OTHER DATA  
FOR P.L. 566 WATERSHED WORK PLANS

A Staff Report on  
Project Plans Approved to July 1973 under Public Law 83-566



Compiled by

Natural Resource Economics Division  
Economic Research Service

for

Soil Conservation Service  
U. S. Department of Agriculture  
Washington, D. C. 20250

August 1974

## PREFACE

THIS INVENTORY PROVIDES INFORMATION ON THE SCOPE AND CHARACTER OF UPSTREAM WATERSHED DEVELOPMENT IN THE UNITED STATES. THE FOCUS IS ON DEVELOPMENT AS AUTHORIZED BY THE WATERSHED PROTECTION AND FLOOD PREVENTION ACT OF 1954 WITH ITS AMENDMENTS, COMMONLY KNOWN AS PUBLIC LAW 566. AS OF JUNE 1973 A TOTAL OF 1,078 PROJECTS ON THE U. S. MAINLAND AND IN HAWAII AND PUERTO RICO HAD BEEN APPROVED FOR OPERATIONS UNDER THE ACT. ORIGINAL PROJECTS HAVE BEEN COMBINED IN TWO INSTANCES TO REDUCE THIS TO 1,075 PROJECTS. THIS IS THE POPULATION OF PROJECTS FROM WHICH INFORMATION FROM RESPECTIVE WORK PLANS HAS BEEN COMPILED IN THIS REPORT.

AS SHOWN IN TABLE 1, A "UNIVERSE" OF POSSIBLE APPROVED PROJECTS CAN BE CONSIDERED AS THE NUMBER OF WATERSHEDS CONSIDERED TO NEED PROJECTS, AS DETERMINED IN THE 1967 USDA NATIONAL INVENTORY OF SOIL AND WATER CONSERVATION NEEDS. A TOTAL OF 8,925 NEEDED PROJECTS HAS BEEN REPORTED IN THE INVENTORY. THESE POTENTIAL PROJECTS WOULD COVER ABOUT 40 PERCENT OF THE AREA IN THE UNITED STATES. THE POPULATION OF 1,075 PROJECTS APPROVED FOR OPERATIONS AS OF JUNE 1973 ENCOMPASSES ABOUT 3.5 PERCENT OF THE COUNTRY'S TOTAL LAND AREA AND ABOUT 9.3 PERCENT OF THE AREA CONSIDERED TO NEED PROJECTS. NATIONALLY, 12 PERCENT OF THE ESTIMATED NEEDED PROJECTS HAVE BEEN APPROVED FOR OPERATIONS. THE RANGE IS FROM 4.7 PERCENT IN THE UPPER MISSISSIPPI REGION TO NEARLY 25 PERCENT IN THE ARKANSAS-WHITE-RED REGION. THERE IS A FAIRLY EQUAL RATE OF PROGRESS IN PROJECT APPROVALS BETWEEN THE EASTERN AND WESTERN STATES, ALTHOUGH THE WEST IS SLIGHTLY AHEAD OF THE EAST AREAWISE. THE MAJOR WATER RESOURCE REGIONS WHICH FORM THE BASIS FOR TABULAR INFORMATION ARE PRESENTED IN FIGURE 1. THESE BOUNDARIES WERE DEFINED BY THE WATER RESOURCES COUNCIL AND ADOPTED IN 1970.

THE SHORT TITLES IN THE LIST OF TABLES ARE INDICATIVE OF THE KINDS OF INFORMATION GLEANED FROM THE 1,075 APPROVED WORK PLANS AND AGGREGATED BY REGIONS OR OTHERWISE. EMPHASIS IS ON THE KIND AND MAGNITUDE OF ESTIMATED PREDEVELOPMENT FLOODING OR ASSOCIATED DAMAGES, ANTICIPATED COSTS OF PLANNED LAND TREATMENT OR STRUCTURES, AND ESTIMATED FLOOD PROTECTION OR WATER SUPPLY DEVELOPMENT BENEFITS.

DURING FISCAL YEAR 1973, 18 NEW PROJECTS WERE APPROVED, 9 EACH IN THE WESTERN AND EASTERN REGIONS OF THE 48 STATES. IN BOTH AREA PER PROJECT AND ESTIMATED TOTAL COST THE NEW PROJECTS EXCEEDED THE PROGRAM AVERAGE BY 18-21 PERCENT, UP SLIGHTLY FROM FISCAL YEAR 1972. THE TWO MAJOR TYPES OF BENEFITS FOR NEW PROJECTS WERE FLOOD DAMAGE REDUCTION (42%) AND DRAINAGE (26%). OTHER TYPES OF BENEFITS WERE LESS THAN 10 PERCENT EACH. DURING THE YEAR, 14 NEW MULTIPURPOSE RESERVOIRS WERE AUTHORIZED SERVING PREDOMINANTLY RECREATION AND LOCAL WATER SUPPLY; TOTAL STORED WATER WAS NINE TIMES THE PREVIOUS YEAR'S TOTAL. FLOOD CONTROL WAS PLANNED FOR ONLY FOUR OF THESE RESERVOIRS. CHANNEL IMPROVEMENT MILES WERE DOUBLE LAST YEAR'S TOTAL ON 15 PROJECTS BUT COSTS ONLY INCREASED BY ONE-FOURTH, INDICATING LESS MAJOR CONSTRUCTION AND FAVORING THE LESS DISTURBING KINDS OF INCREASED CHANNEL CAPACITY. CHANNEL EXCAVATION PER MILE OF CHANNEL WAS ONLY TWO-THIRDS OF PROGRAM AVERAGE. COST SHARING SHOWED THAT FLOOD PROTECTION AND PROJECT ADMINISTRATION WERE ABOUT 84 PERCENT FEDERAL. FOR ALL OTHER PURPOSES, NON-FEDERAL SOURCES BORE THE MAJOR SHARE, WITH A NEAR-EQUAL SPLIT FOR RECREATION COSTS.

THIS REPORT OF WATERSHED PROJECT INFORMATION BY THE NATURAL RESOURCES ECONOMICS DIVISION OF THE ECONOMIC RESEARCH SERVICE WAS PREPARED BY C. DUDLEY MATTSON. JEREMIAH WILLIAMS DID THE MAJOR WORK OF ASSEMBLING AND PREPARING THE INFORMATION. DATA STORAGE PROBLEMS DURING THE YEAR REQUIRED MAJOR EFFORT TO RE-COLLATE THE DATA ON NEW FORMS. THIS INVOLVED SEVERAL MONTHS' WORK BY BARBARA BARBER AND MR. WILLIAMS, AND ACCOUNTS FOR THE LATENESS OF THIS REPORT. THE WASHINGTON DATA CENTER ASSISTED IN PREPARATION OF PRINTING COPY BY COMPUTER.



## GLOSSARY OF TERMS USED

MOST TERMS IN THIS REPORT ARE SELF-EXPLANATORY. HOWEVER, THOSE WHICH MAY NOT BE SELF-EVIDENT OR WHICH INCLUDE SEVERAL RELATED CATEGORIES ARE DEFINED BELOW IN THREE GROUPS: BENEFITS, DAMAGES, AND MISCELLANEOUS.

### I. BENEFITS (TABLES 4, 5, 17)

1. CHANGED LAND USE: INCREASED NET INCOME FROM A CHANGE TO A MORE PRODUCTIVE USE OF LAND AS A RESULT OF PROTECTION FROM FLOODING.
2. INCIDENTAL RECREATION: BENEFITS FROM RECREATION USE OF WATER STORED FOR OTHER PURPOSES
3. INTENSIFIED LAND USE: INCREASED NET INCOME RESULTING FROM REDUCTION IN FLOOD HAZARD TO THE POINT THAT IT BECOMES PROFITABLE TO INTENSIFY MANAGEMENT EFFORTS ON EXISTING CROPLAND SUCH AS: IMPROVED SEEDING, INCREASED FERTILIZATION, OR SHIFTS TO MORE PRODUCTIVE CROPS.
4. OTHER FLOOD PREVENTION: INCLUDES BENEFITS FROM TREATMENT OF CRITICALLY ERODED AREAS, ROAD BANK STABILIZATION, AND REDUCED MAINTENANCE COSTS FOR ROADS, BRIDGES, AND FARM EQUIPMENT.
5. REDEVELOPMENT BENEFITS: BENEFITS DERIVED FROM ADDED EMPLOYMENT AS A RESULT OF THE PROJECT IN DESIGNATED ECONOMICALLY DEPRESSED AREAS.
6. SECONDARY BENEFITS: VALUES ADDED OVER AND ABOVE THE IMMEDIATE SERVICES OF THE PROJECT AS A RESULT OF ACTIVITIES "STEMMING FROM" OR "INDUCED BY" THE PROJECT.
7. WATER MANAGEMENT BENEFITS:
  - A. OTHER NON-AGRICULTURE: INCLUDES SUCH ITEMS AS: DRAINAGE TO URBAN AREAS, GROUND-WATER RECHARGE, AND WATER QUALITY MANAGEMENT.
  - B. OTHER AGRICULTURE: INCLUDES RURAL WATER SUPPLY, STOCK WATER DEVELOPMENT, FIRE PROTECTION, SPRAYING WATER, ETC.

### II. DAMAGES (TABLES 3, 9, 14, AND 16)

1. CROP AND PASTURE: INCLUDES THOSE INCURRED DIRECTLY FROM FLOODING AND WATER ACTION, AS OPPOSED TO SEDIMENT AND EROSION DAMAGES, SHOWN SEPARATELY.
2. INDIRECT DAMAGES: THESE COVER A WIDE VARIETY OF EFFECTS FROM FLOODING ON THE CONDUCT OF NORMAL BUSINESS AND FARMING ACTIVITIES. EXAMPLES INCLUDE: LOSS TO CONSUMER OF POWER FROM THE INTERRUPTION OF POWER SERVICES; ADDED TRAVEL COSTS AND TIME DELAYS DUE TO REROUTED TRAFFIC AROUND DAMAGED ROADS; INTERRUPTION OF THE FEEDING SCHEDULE OF CATTLE.
3. NON-AGRICULTURAL DAMAGE: THIS INCLUDES DAMAGE TO ROADS AND BRIDGES, RESIDENTIAL AND URBAN PROPERTY, PUBLIC UTILITIES, COMMERCIAL AND INDUSTRIAL STRUCTURES, ETC.
4. OTHER AGRICULTURAL: THESE INCLUDE PRIMARILY LOSSES TO FARM IMPROVEMENTS, E.G. BUILDINGS, FENCES, MACHINERY, ETC.
5. OTHER SEDIMENT DAMAGES: INCLUDES CLEAN-UP COSTS FROM SEDIMENT DEPOSITED IN BUILDINGS, STREETS, AND ROADS; DAMAGE TO FISH AND WILDLIFE HABITAT; DAMAGE TO EQUIPMENT FROM USE OF POOR-QUALITY WATER, ETC.

6. RESTORATION OF FORMER PRODUCTIVITY: A MEASURE OF THE LOSS DUE TO REPEATED FLOODING OF LAND ONCE USED INTENSIVELY, WHICH CAN NOW BE USED ONLY FOR LIMITED, LOW-LEVEL PRODUCTION OR NO PRODUCTIVE USE.

7. STREAMBANK EROSION: LOSS IN THE VALUE OF LAND VOIDED FROM EROSION OF THE STREAMBANKS AND INCLUDES DAMAGE FROM SEDIMENT DEPOSITION DOWNSTREAM.

### III. MISCELLANEOUS (TABLES 1, 2, 7, 8, 9, 12)

1. AREA NEEDING PROJECTS: THE AREA OF ALL POTENTIALLY FEASIBLE PROJECT AREAS AS REPORTED IN THE 1967 USDA INVENTORY OF SOIL AND WATER CONSERVATION NEEDS.

2. B/C RATIO: THE RATIO OF ANNUAL BENEFITS TO ANNUAL COSTS.

3. LAND AREA: DATA SECURED FROM THE NATIONAL INVENTORY OF SOIL AND WATER CONSERVATION NEEDS, 1967 (CNI), USDA STATISTICAL BUL. NO. 461. THESE FIGURES EXCLUDE ALL WATER AREAS EXCEEDING 40 ACRES AND RIVERS WIDER THAN 1/8 MILE (TABLE 1).

4. LAND TREATMENT: MEASURES NEEDED ON SELECTED LANDS IN A PROJECT AREA TO SOLVE CONSERVATION PROBLEMS AND SECURE BETTER SOIL AND WATER MANAGEMENT. THEY INCLUDE BUT ARE NOT LIMITED TO: RESIDUE AND ANNUAL COVER; SOD IN ROTATION; CONTOURING; STRIP CROPPING; TERRACING; DIVERSIONS; PERMANENT COVER; DRAINAGE; CROP ROTATION; WATER MANAGEMENT (IRRIGATED LAND); PROPER GRAZING USE; PASTURE AND HAYLAND PLANTING; BRUSH CONTROL; WOODLAND IMPROVEMENTS; ETC.

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NOTES: ORIGINAL APPROVALS INCLUDED THREE WORK PLANS WHICH HAVE SINCE BEEN  
COMBINED WITH ADJOINING AREAS FOR FUNDING AND INSTALLATION. ALL ARE  
IN THE TEXAS-GULF REGION.

BECAUSE OF ROUNDING SOME TOTALS MAY NOT CORRECTLY REFLECT THE SUM OF  
ITEMS SHOWN.



# WATER RESOURCE REGIONS

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



NOVEMBER 1970

USDA-SCS HYATTSVILLE MD 1970



TABLE 1. ESTIMATED WATERSHED PROJECTS NEEDED AND PROJECTS APPROVED UNDER P.L. 556 AS OF JUNE 30, 1973,

## BY WATER RESOURCE REGIONS 1/

WATER RESOURCE REGIONS:	APPROXIMATE :		AREA :		AREA IN :		NEEDED :		TOTAL :		WATERSHEDS :		WATERSHED :		NEEDED :	
	:		:		:		:		:		:		:		:	
	LAND AREA :	PROJECTS 2/ :	NEEDING :	APPROVED :	PROJECTS :	AREA :	APPROVED :	WATERSHEDS :	NEEDING :	PROJECTS 2/ :	APPROVED 3/ :	PROJECTS :	APPROVED :			
-----MILLIONS OF ACRES-----																
:	PERCENT						NUMBER OF WATERSHEDS						PERCENT			
:	-----															
NEW ENGLAND	37.7	15.0	1.49	9.9	588	235	34	14.5								
MIDDLE ATLANTIC	71.7	28.0	2.70	9.6	1,117	447	70	15.7								
SOUTH ATLANTIC-GULF	166.4	94.6	11.62	12.3	2,365	1,373	198	14.4								
GREAT LAKES	80.9	25.0	1.34	5.4	1,075	313	27	8.6								
OHIO	100.7	48.0	5.39	11.2	1,898	800	104	13.0								
TENNESSEE	27.1	12.0	1.68	14.0	509	245	28	11.4								
UPPER MISSISSIPPI	113.4	74.4	2.38	3.2	1,977	1,170	55	4.7								
LOWER MISSISSIPPI	63.4	40.9	6.79	16.6	792	635	95	15.0								
-----																
EASTERN REGIONS	661.3	337.9	33.39	9.9	10,321	5,218	611	11.7								
SOURIS-RED-RAINY	33.9	19.8	2.96	14.9	355	182	21	11.5								
MISSOURI	324.9	128.7	6.68	5.2	2,780	1,318	136	10.3								
ARKANSAS-WHITE-RED	155.0	66.0	11.53	17.5	1,240	549	131	23.9								
TEXAS-GULF	119.6	30.3	5.21	17.2	701	238	45	18.9								
RIO GRANDE	79.9	15.9	2.30	14.5	546	161	34	21.1								
UPPER COLORADO	65.7	35.9	.42	5.2	1,035	274	7	8.0								
LOWER COLORADO	98.8	*	1.44	*	*	*	15	*								
GREAT BASIN	75.4	24.6	1.07	4.3	376	182	14	7.7								
COLUMBIA-NO-PACIFIC	180.9	52.0	1.23	2.4	1,452	547	31	5.7								
CALIFORNIA-SO-PACIFIC	103.9	12.3	.91	7.4	291	207	21	10.1								
-----																
WESTERN REGIONS	1,238.0	385.5	33.75	8.8	8,776	3,658	455	12.4								
-----																
MAINLAND 48 STATES	1,899.3	723.4	67.14	9.3	19,097	8,876	1,066	12.0								
ALASKA																
HAWAII	4.0	1.0	.28	28.0	98	28	6	21.4								
-----																
UNITED STATES	1,903.3	724.4	67.42	9.3	19,195	8,904	1,072	12.0								
PUERTO RICO	2.2	1.8	.25	13.9	28	21	3	14.3								
-----																
PROGRAM TOTAL	1,905.5	726.2	67.67	9.3	19,223	8,925	1,075	12.0								

1/ WATER RESOURCE REGIONS CONFORM TO THE NATIONAL ASSESSMENT OF WATER AND RELATED LAND RESOURCES, 1970. ESTIMATES OF NEED ARE FROM PRELIMINARY DATA IN 1967 USDA INVENTORY OF SOIL AND WATER CONSERVATION NEEDS. DATA ON APPROVED PROJECTS ARE FROM 1,078 WORK PLANS APPROVED THROUGH JUNE 30, 1973.

2/ CNI DATA ARE TABULATED BY MAJOR DRAINAGE AREAS WHICH DO NOT EXACTLY CONFORM TO WATER RESOURCE REGIONS LISTED.

3/ ORIGINAL APPROVALS IN THE TEXAS-GULF REGION INCLUDED FIVE PROJECTS WHICH HAVE BEEN COMBINED INTO TWO FOR INSTALLATION. DATA HAVE BEEN CONSOLIDATED INTO TWO PROJECTS.

\* LOWER COLORADO COMBINED WITH UPPER COLORADO FOR THESE ITEMS.

TABLE 2. SELECTED DATA FROM WATERSHED WORK PLANS APPROVED FOR OPERATIONS, BY WATER RESOURCE REGIONS,  
THROUGH JUNE 30, 1973

WATER RESOURCE REGION:	PROPORTION OF REGION IN PROJECT AREAS	ANNUAL DAMAGE BEFORE PROJECTS	ANNUAL BENEFITS STRUCTURAL MEASURES	COSTS OF WORKS OF IMPROVEMENT LAND TREATMENT	STRUCTURES	TOTAL	ANNUAL COST OF STRUCTURES	TOTAL B/C RATIO
	PERCENT						\$1,000	
NEW ENGLAND	4.0	3,292	4,877	9,247	75,341	84,588	3,080	1.58/1
MIDDLE ATLANTIC	3.8	4,559	12,060	24,098	122,662	146,760	5,652	2.13/1
SOUTH ATLANTIC-GULF	7.0	13,088	25,571	135,717	283,011	418,728	13,404	1.91/1
GREAT LAKES	1.7	1,787	5,133	14,247	37,262	51,509	1,902	2.70/1
OHIO	5.4	8,007	15,256	60,823	194,944	255,766	9,114	1.67/1
TENNESSEE	6.2	2,559	2,783	16,106	40,395	56,501	1,793	1.55/1
UPPER MISSISSIPPI	2.1	2,065	4,795	17,228	52,864	70,093	2,696	1.78/1
LOWER MISSISSIPPI	10.7	11,438	19,070	87,362	143,979	231,341	7,562	2.52/1
EASTERN REGIONS	5.0	46,795	89,545	364,828	950,458	1,315,286	45,203	1.98/1
SOURIS-RED-RAINY	8.7	3,866	3,006	8,749	29,435	38,184	1,405	2.14/1
MISSOURI	2.1	10,355	11,162	63,239	132,876	196,165	6,501	1.72/1
ARKANSAS-WHITE-RED	7.4	17,268	20,925	84,562	281,499	366,061	11,781	1.78/1
TEXAS-GULF	4.4	5,789	6,376	42,674	84,393	127,066	3,272	1.95/1
RIO GRANDE	2.9	4,511	6,377	21,318	52,774	74,092	2,496	2.55/1
UPPER COLORADO	.6	112	778	4,390	8,379	12,768	352	2.21/1
LOWER COLORADO	1.5	2,929	3,059	9,008	37,772	46,779	1,610	1.90/1
GREAT BASIN	1.4	652	1,510	9,407	18,289	27,696	831	1.82/1
COLUMBIA-NO. PACIFIC	.7	1,927	6,797	13,774	58,841	72,614	2,837	2.40/1
CALIFORNIA-SO. PACIFIC	.9	4,687	9,183	12,342	100,512	112,854	4,650	1.97/1
WESTERN REGIONS	2.7	52,096	69,173	269,513	804,770	1,074,279	35,735	1.94/1
MAINLAND 48 STATES	3.5	98,891	158,718	634,341	1,755,228	2,389,565	80,938	1.96/1
ALASKA								/1
HAWAII	7.0	927	1,038	2,502	16,495	18,997	783	1.33/1
UNITED STATES	3.5	99,818	159,756	636,843	1,771,723	2,408,562	81,721	1.95/1
PUERTO RICO	11.4	1,202	1,829	2,699	11,190	13,888	697	2.62/1
PROGRAM TOTAL	3.6	101,020	161,585	639,542	1,782,913	2,422,450	82,418	1.96/1

TABLE 3. TOTAL FLOOD DAMAGES AND REDUCTION IN DAMAGES ESTIMATED IN WDRK PLANS APPROVED FOR OPERATIONS THROUGH JUNE 30, 1973,

AND FOR FISCAL YEAR 1973

TYPE OF DAMAGE	PROGRAM TOTAL, 1,075 PROJECTS				FISCAL YEAR 1973, 18 PROJECTS			
	ANNUAL DAMAGE : BEFORE PROJECT :		REDUCTION IN ANNUAL DAMAGE :		ANNUAL DAMAGE : BEFORE PROJECT :		REDUCTION IN ANNUAL DAMAGE :	
	PERCENT BY TYPE	\$1,000	PERCENT REDUCTION	PERCENT OF TOTAL REDUCTION	PERCENT BY TYPE	\$1,000	PERCENT REDUCTION	PERCENT OF TOTAL REDUCTION
CROP AND PASTURE	50.0	50,517	77.0	48.9	58.7	1,815	83.0	57.9
RESTORATION OF PRODUC- TIVITY 1/	4.7	4,727	99.8	5.9	.1	4	100.0	.2
OTHER AGRICULTURAL DAMAGE	4.8	4,887	76.4	4.7	3.9	120	71.7	3.3
NONAGRICULTURAL DAMAGE	23.8	23,921	82.4	24.8	21.2	659	89.2	22.5
OVERBANK DEPOSITION	2.9	2,945	77.0	2.8	.4	12	64.6	.3
RESERVOIR SEDIMENTATION	.4	440	68.0	.4	.4	11	41.3	.2
OTHER SEDIMENT DAMAGE	2.7	2,689	80.1	2.7	1.4	43	77.6	1.3
FLOOD PLAIN SCOUR	2.2	2,258	69.3	2.0	1.7	53	48.9	1.0
STREAMBANK EROSION 2/	.9	948	83.8	1.0	.4	13	99.8	.5
GULLY EROSION	3.5	3,506	87.0	3.8	6.2	191	100.0	7.4
INDIRECT DAMAGE	8.8	8,907	79.9	8.9	5.7	177	82.1	5.6
TOTAL	100.0	101,019	78.8	100.0	100.0	3,094	84.0	100.0

1/ INCLUDED IN CROP AND PASTURE DAMAGE.

2/ INCLUDES DOWNSTREAM EROSION, OFF PROJECT.

3/ TOTAL REDUCTION IN DAMAGE INCLUDES APPROXIMATELY \$4.8 MILLION (TOTAL) AND \$ 71,000 (1973) CREDITED TO LAND-TREATMENT MEASURES FOR WATERSHED PROTECTION, AND EXCLUDES REDUCTION IN FLOOD DAMAGES BELOW PROJECT AREAS.



TABLE 4. TYPES OF BENEFITS FROM STRUCTURAL MEASURES INCLUDED IN WATERSHED WORK PLANS APPROVED FOR OPERATIONS THROUGH JUNE 30, 1973, AND FOR FISCAL YEAR 1973

TYPE OF BENEFIT	PROGRAM TOTAL, 1,075 PROJECTS				FISCAL YEAR 1973, 18 PROJECTS			
	AMOUNT	PROPORTION	AMOUNT	PROPORTION	AMOUNT	PROPORTION	AMOUNT	PROPORTION
	OF	OF TOTAL	OF	OF TOTAL	OF	OF TOTAL	OF	OF TOTAL
	ANNUAL BENEFITS	ANNUAL BENEFITS	ANNUAL BENEFITS	ANNUAL BENEFITS	ANNUAL BENEFITS	ANNUAL BENEFITS	ANNUAL BENEFITS	ANNUAL BENEFITS
	\$1,000	PERCENT	\$1,000	PERCENT	\$1,000	PERCENT	\$1,000	PERCENT
FLOOD DAMAGE REDUCTION	74,855	45.0	2,528	41.9				
CHANGED LAND USE: AGRICULTURE	3,633	2.2	9	.1				
CHANGED LAND USE: URBAN	2,441	1.5		*				
INTENSIFIED LAND USE	10,812	6.5	264	4.4				
OTHER FLOOD PREVENTION 1/	5,557	3.3	78	1.3				
DRAINAGE	13,920	8.4	1,573	26.1				
IRRIGATION	6,937	4.2		*				
OTHER WATER MANAGEMENT: AGRICULTURAL	629	.4	3	*				
FISH AND WILDLIFE	2/	2/		*				
OTHER NONAGRICULTURAL 3/	1,147	.7	100	1.7				
MUNICIPAL AND INDUSTRIAL WATER	4,092	2.5	70	1.2				
RECREATION	23,530	14.0	487	8.0				
INCIDENTAL RECREATION 4/	1,816	1.1	26	.4				
OTHER INCIDENTAL		*		*				
OFF-PROJECT BENEFITS 5/	1,957	1.2	62	1.0				
REDEVELOPMENT BENEFITS	3,347	2.0	237	3.9				
LOCAL SECONDARY BENEFITS	11,663	7.0	601	10.0				
TOTAL	166,338	100.0	6,038	100.0				

1/ INCLUDES BENEFITS FROM CRITICAL AREA TREATMENT AND FROM LAND TREATMENT FOR FLOOD PREVENTION, E.G., INCREASED FARM INCOME FROM PRODUCTION RESULTING FROM CONSERVATION MEASURES SUCH AS PLANTED TREES AND GRASS, REDUCED FIRE LOSSES, AND REDUCED MAINTENANCE OF ROADS, BRIDGES, AND FARM EQUIPMENT.

2/ NOT SHOWN SEPARATELY IN EARLY PLANS, INCLUDED IN OTHER NONAGRICULTURE WATER MANAGEMENT.

3/ INCLUDES DRAINAGE BENEFITS TO URBAN AREAS.

4/ RECREATION BENEFITS DERIVED FROM USE OF WATER STORED FOR OTHER PURPOSES.

5/ REDUCTION IN FLOOD DAMAGES BELOW AUTHORIZED WATERSHED AREAS.

\* LESS THAN .05 PERCENT OR \$500.



TABLE 5. COMPONENTS OF COSTS OF STRUCTURES INCLUDED IN 1,075 WATERSHED WORK PLANS APPROVED FOR OPERATION

THROUGH JUNE 30, 1973

TYPE OF STRUCTURE	STRUCTURE : OR : OPERATION :	CONSTRUCTION :	ENGINEERING : SERVICES :	LAND : RIGHTS 1/ :	RELOCATION : PAYMENTS 2/ :	TOTAL : :	PERCENT : OF TOTAL : STRUCTURES :
	NUMBER	\$1,000	PERCENT	\$1,000	PERCENT	\$1,000	PERCENT
FLOODWATER RETARDING (FWR)	6,087	472,202	67.9	113,851	16.4	107,803	15.5
GRADE STABILIZING (GS)	2,506	30,627	73.5	8,976	21.6	2,041	4.9
FWR AND GS COMBINED	159	4,341	70.5	1,410	22.9	404	6.6
MULTIPURPOSE RESERVOIR (MP)	528	173,485	64.5	32,034	11.9	62,429	23.2
OTHER SINGLE PURPOSE RESERVOIRS	114	5,839	66.3	1,464	16.6	1,507	17.1
	MILES						
CHANNEL IMPROVEMENT (CI) 3/	20,980	349,676	65.7	86,015	16.2	96,476	18.1
DIKES AND LEVEES	4/	7,177	66.7	1,622	15.1	1,960	18.2
FLOODWAYS & DIVERSIONS	4/	13,829	66.6	3,196	15.4	3,753	18.1
DEBRIS BASINS	4/	6,241	75.5	1,506	18.2	516	6.3
BASIC RECREATION FACILITIES	4/	48,162	68.6	5,860	8.4	15,803	22.5
CRITICAL AREA TREATMENT	4/	1,769	81.4	282	13.0	121	5.6
MISCELLANEOUS STRUCTURES	4/	39,479	78.5	7,132	14.2	3,540	7.0
INSTALLATION COST, ALL STRUCTURES		1,152,827	67.2	263,347	15.4	296,352	17.3
PROJECT ADMINISTRATION 5/						2,716	1,715,241
TOTAL PROJECT COST, STRUCTURES						67,668	100.0
						1,782,909	

1/ INCLUDES EASEMENTS, RIGHTS-OF-WAY, AND WATER RIGHTS.

2/ THESE COSTS WERE FIRST REPORTED IN FISCAL YEAR 1972.

3/ INCLUDES COSTS OF LEVEES BUILT IN CONJUNCTION WITH CHANNEL IMPROVEMENTS. COSTS ARE INSEPARABLE IN WORK PLANS.

4/ NOT REPORTED IN COMPARABLE UNITS.

5/ PROJECT ADMINISTRATION COVERS ONLY THOSE PROJECTS APPROVED OR REVISED SINCE MAY 1968, WHEN THIS COST WAS FIRST REPORTED.

TABLE 6 COMPONENTS OF PERCENTAGE DISTRIBUTION OF COSTS OF STRUCTURES INCLUDED IN 18 WATERSHED WORK PLANS APPROVED

## FOR OPERATIONS FOR FISCAL YEAR 1973

TYPE OF STRUCTURE	STRUCTURE : OR : OPERATION :	CONSTRUCTION : PERCENT	ENGINEERING : SERVICES	LAND : RIGHTS /1	RELOCATION : PAYMENTS /2	TOTAL : STRUCTURES	PERCENT
	NUMBER	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	PERCENT
FLOODWATER RETARDING (FWR)	119	10,327	1,383	1,515	110	13,335	38.7
GRADE STABILIZING (GS)	86	2,184	294	101	3.9	2,579	7.5
FWR AND GS COMBINED	4	382	35	43	9.4	459	1.3
MULTIPURPOSE RESERVOIR (MP)	14	4,042	397	996	162	5,595	16.3
OTHER SINGLE PURPOSE-RESERVOIRS (SP)							
	MILES						
CHANNEL IMPROVEMENT (CI) 3/	646	5,941	449	3,018	32.1	9,407	27.4
DIKES AND LEVEES	4/						
FLOODWAYS & DIVERSIONS	4/	315	48	164	31.1	527	1.5
DEBRIS BASINS	4/						
BASIC RECREATION FACILITIES	4/	872	104	180	15.6	1,156	3.4
CRITICAL AREA TREATMENT	4/						
MISCELLANEOUS STRUCTURES	4/	1,119	140	71	5.3	1,330	3.9
INSTALLATION COST, ALL STRUCTURES		25,181	2,848	6,088	271	34,388	100.0
PROJECT ADMINISTRATION 5/						4,997	
TOTAL PROJECT COST, STRUCTURES						39,385	

1/ INCLUDES EASEMENTS, RIGHTS-OF-WAY, AND WATER RIGHTS.

2/ THESE COSTS WERE FIRST REPORTED IN FISCAL YEAR 1972.

3/ INCLUDES COSTS OF LEVEES BUILT IN CONJUNCTION WITH CHANNEL IMPROVEMENTS. COSTS ARE INSEPARABLE IN WORK PLANS.

4/ NOT REPORTED IN COMPARABLE UNITS.

5/ PROJECT ADMINISTRATION COVERS ONLY THOSE PROJECTS APPROVED OR REVISED SINCE MAY 1968, WHEN THIS COST WAS FIRST REPORTED.

TABLE 7. ALLOCATION OF TOTAL INSTALLATION COSTS FOR 1,075 WATERSHED WORK PLANS

APPROVED FOR OPERATIONS THROUGH JUNE 30, 1973

ITEM	COSTS		PROPORTION		PLANS INCLUDING
	P.L. 566	OTHER	OF TOTAL	OF TOTAL	
					PURPOSE
	\$1,000	\$1,000	\$1,000	PERCENT	NUMBER
LAND TREATMENT:					
APPLICATION OF TREATMENT MEASURES	11,978	539,541	551,519	22.8	ALL
TECHNICAL ASSISTANCE	58,189 1/	29,833	88,022	3.6	ALL
TOTAL LAND TREATMENT	70,167	569,374	639,541	26.4	ALL
PURPOSE OF STRUCTURES:					
FLOOD PREVENTION	1,129,385	216,219	1,345,604	55.5	1,059
DRAINAGE	39,067	46,396	85,463	3.5	255
IRRIGATION	32,951	29,104	62,055	2.6	83
OTHER AGRICULTURAL WATER MANAGEMENT	2,740	3,549	6,289	.3	10
MUNICIPAL AND INDUSTRIAL WATER	57	50,722	50,779	2.1	138
RECREATION	61,565	88,824	150,389	6.2	223
FISH AND WILDLIFE	6,406	8,174	14,580	.6	79
OTHER NONAGRICULTURAL WATER MANAGEMENT	3	81	84	*	4
PROJECT ADMINISTRATION 2/	62,038	5,630	67,668	2.8	--
TOTAL STRUCTURES	1,334,212	448,697	1,782,909	73.6	1,075
TOTAL ALL INSTALLATIONS	1,404,379	1,018,072	2,422,451	100.0	1,075

1/ FROM OTHER ON-GOING PROGRAMS.

2/ INCLUDES ONLY PROJECTS APPROVED OR SUPPLEMENTED SINCE MAY 1968.

\* LESS THAN .05 PERCENT.



TABLE 8. FOR FISCAL YEAR 1973, ALLOCATION OF TOTAL INSTALLATION COSTS FOR

## 18 WATERSHED WORK PLANS APPROVED

ITEM	COSTS			PROPORTION OF TOTAL	PLANS INCLUDING PURPOSE
	P.L. 566	OTHER	TOTAL		
	\$1,000	\$1,000	\$1,000	PERCENT	NUMBER
LAND TREATMENT:					
APPLICATION OF TREATMENT MEASURES	100	14,463	14,563	25.7	ALL
TECHNICAL ASSISTANCE	1,805	1/ 921	2,726	4.8	ALL
TOTAL LAND TREATMENT	1,905	15,384	17,289	30.5	ALL
PURPOSE OF STRUCTURES:					
FLOOD PREVENTION	21,635	3,994	25,629	45.2	17
DRAINAGE	1,908	2,831	4,739	8.4	4
IRRIGATION	--	--	--	*	--
OTHER AGRICULTURAL WATER MANAGEMENT	--	--	--	*	--
MUNICIPAL AND INDUSTRIAL WATER	22	604	626	1.1	3
RECREATION	1,663	1,697	3,360	5.9	6
FISH AND WILDLIFE	--	--	--	*	--
OTHER NONAGRICULTURAL WATER MANAGEMENT	--	35	35	.1	1
PROJECT ADMINISTRATION	4,642	355	4,997	8.8	--
TOTAL STRUCTURES	29,870	9,516	39,386	69.5	--
TOTAL ALL INSTALLATIONS	31,774	24,899	56,673	100.0	18

1/ FROM OTHER ON-GOING PROGRAMS.

\* LESS THAN .05 PERCENT.



TABLE 9. AVERAGES PER WATERSHED FOR COSTS, FLOOD DAMAGES, AND BENEFITS FOR  
WORK PLANS APPROVED FOR OPERATION, UNITED STATES

ITEM	AVERAGE PER WATERSHED, 1,075 PLANS		AVERAGE PER WATER-SHED, 18 PLANS, FISCAL YEAR 1973	
	DOLLARS		DOLLARS	
COST OF INSTALLATION:				
LAND TREATMENT MEASURES	594,922	:	960,470	:
FLOODWATER RETARDING STRUCTURES 1/	652,240	:	766,322	:
GRADE STABILIZATION STRUCTURES	38,738	:	143,281	:
MULTIPLE-PURPOSE STRUCTURES	250,211	:	310,859	:
ALL OTHER STRUCTURES	663,686	:	689,998	:
TOTAL INSTALLATION COSTS	2,190,495	:	2,870,931	:
AVERAGE ANNUAL FLOOD DAMAGE:				
ALL FLOODWATER DAMAGE 2/	73,791	:	144,075	:
ALL SEDIMENT DAMAGE	5,651	:	3,714	:
ALL EROSION DAMAGE	5,845	:	13,921	:
INDIRECT DAMAGE	8,285	:	9,843	:
TOTAL ANNUAL FLOOD DAMAGES	93,971	:	171,877	:
AVERAGE ANNUAL BENEFITS:				
ALL FLOOD DAMAGE REDUCTION 2/	76,623	:	148,264	:
LAND ENHANCEMENT	15,708	:	15,151	:
DRAINAGE	12,949	:	87,407	:
IRRIGATION	6,453	:	--	:
RECREATION 3/	23,578	:	28,479	:
ALL OTHER WATER MANAGEMENT 4/	19,299	:	50,772	:
TOTAL ANNUAL BENEFITS	154,733	:	335,456	:

1/ INCLUDES STRUCTURES COMBINING FLOODWATER RETENTION WITH GRADE STABILIZATION.

2/ INCLUDES OFF PROJECT DAMAGES AND BENEFITS.

3/ INCLUDES INCIDENTAL RECREATION BENEFITS.

4/ INCLUDES LOCAL SECONDARY AND REDEVELOPMENT BENEFITS.

TABLE 10. DESIGN DATA FOR WATER-RETARDING STRUCTURES AND CHANNEL IMPROVEMENT INCLUDED IN WATERSHED WORK PLANS

ITEM	UNIT OF SIZE	PROGRAM TOTAL	1,075 PLANS	FISCAL YEAR 1973, 18 PLANS	TOTAL SIZE: OF UNITS	AVERAGE SIZE: PER UNIT	TOTAL SIZE: OF UNITS	AVERAGE SIZE: PER UNIT	STRUCTURES	NUMBER
WATER-RETARDING STRUCTURES: 1/										
FILL	1,000 CU. YDS.	992,580	144	6,888	13,636	100			137	
STORAGE CAPACITY:										
SEDIMENT POOL	AC. FT.	1,430,775	208	6,888	23,388	171			137	
FLOODWATER POOL	AC. FT.	6,747,250	996	6,774	98,318	718			137	
WATER SUPPLY:										
IRRIGATION	AC. FT.	2/	--	--	--	--			--	
M & I WATER	AC. FT.	2/	--	--	2,960	987			3	
F & W WATER	AC. FT.	2/	--	--	674	--			--	
RECREATION WATER	AC. FT.	2/	--	--	17,069	1,552			11	
MISCELLANEOUS	AC. FT.	2/	--	--	--	--			--	
TOTAL WATER SUPPLY	AC. FT.	1,256,007	1,956	642	20,703	1,479			14	
TOTAL STORAGE CAPACITY	AC. FT.	9,434,032	1,370	6,888	142,409	1,039			137	
AREA INUNDATED BY RESEVOIRS: 3/										
SEDIMENT POOL	ACRES	230,533	33	6,888	3,057	22			137	
WATER SUPPLY POOL	ACRES	92,436	144	642	1,669	119			14	
FLOODWATER POOL	ACRES	523,346	77	6,774	9,593	70			137	
TOTAL AREA	ACRES	846,315	123	6,888	14,319	105			137	
FILL VOLUMES:										
PER ACRE-FOOT OF STORAGE	CU. YDS.	105	--	--	96	--			--	
PER SURFACE ACRE	CU. YDS.	1,173	--	--	952	--			--	
CHANNEL IMPROVEMENT:										
EXCAVATION	1,000 CU. YDS.	480,449	22.9	20,980	9,740	15.1			646	

1/ INCLUDES FLOODWATER-RETARDING STRUCTURES COMBINED WITH GRADE STABILIZATION.

2/ BREAKDOWNS WERE NOT AVAILABLE FOR EARLIER PLANS.

3/ THE INUNDATED ACRES SHOWN ARE INCREMENTAL.





TABLE 12. PERCENTAGE DISTRIBUTION OF INSTALLATION COSTS BY TYPE OF MEASURE IN 1,075 WATERSHED WORK PLANS THROUGH JUNE 30, 1973,  
BY WATER RESOURCE REGIONS - PART 1

STRUCTURAL MEASURES														
FLOOD- : WATER : RETARD- : ING :	GRADE : STABIL- : IZING : STRUCT.:	FWR : AND : GS : STRUCT.:	MULTI- : PLE : PURPOSE : STRUCT.:	OTHER : SINGLE : PURPOSE : RES. :	CHANNEL : IM- : PROVE- : MENT :	DIKES : AND : LEVEES : SIO NS :	FLOOD- : WAY AND : DIVER- : SIO NS :	DEBRIS : BASINS : TIES :	BASIC : REC. : FACILI- : SIO NS :	CRIT- : ICAL : AREA : TRMT. :	MISCEL- : LANEOUS : STRUC- : TURES :	TOTAL		
PERCENT														
NEW ENGLAND	29.6	--	--	28.8	1.1	22.4	0.2	--	2.5	--	0.1	84.9		
MIDDLE ATLANTIC	26.2	0.3	--	23.0	1.1	17.7	0.9	0.1	10.3	--	0.5	80.5		
SOUTH ATLANTIC-GULF	23.9	0.9	--	8.4	0.6	27.4	0.7	*	2.3	0.3	0.7	65.3		
GREAT LAKES	10.0	*	--	14.7	1.0	42.5	*	0.2	0.5	--	1.4	70.6		
OHIO	27.2	0.1	*	19.4	0.1	17.2	0.2	--	7.5	--	0.1	71.9		
TENNESSEE	38.5	--	--	4.4	0.4	24.9	--	--	0.3	*	0.1	68.6		
UPPER MISSISSIPPI	24.1	5.1	0.3	17.8	--	12.8	0.2	0.9	6.9	--	3.9	72.1		
LOWER MISSISSIPPI	15.9	0.5	--	4.5	--	36.8	0.8	0.2	1.0	0.3	0.8	60.8		
EASTERN REGIONS														
23.9	0.7	*	13.4	0.5	25.4	0.5	0.1	0.1	4.1	0.2	0.7	69.5		
SOURIS-RED-RAINY														
13.8	--	--	6.3	0.2	48.7	--	2.8	--	1.3	--	0.3	73.5		
MISSOURI														
30.3	15.5	3.0	6.3	0.7	5.1	0.1	1.6	0.1	1.6	*	1.1	65.3		
ARKANSAS-WHITE-RED														
51.9	0.1	--	11.9	--	5.9	*	0.3	0.1	1.9	*	0.9	73.2		
TEXAS-GULF														
49.8	0.6	--	2.4	--	10.6	0.2	*	--	0.3	*	0.1	64.0		
RIO GRANDE														
35.8	0.1	--	0.8	--	27.6	*	2.8	0.1	0.1	--	--	67.2		
UPPER COLORADO														
6.3	0.6	--	28.7	2.3	0.4	*	0.3	3.9	0.7	--	22.4	65.6		
LOWER COLORADO														
44.1	*	--	--	--	7.1	1.9	18.6	3.9	--	--	3.2	78.9		
GREAT BASIN														
11.2	1.3	*	11.1	0.4	3.1	--	2.5	10.1	0.4	--	22.5	62.7		
COLUMBIA-NO. PACIFIC														
0.1	0.1	--	24.5	1.5	27.4	3.1	2.5	*	2.1	--	16.6	77.9		
CALIFORNIA-SO. PACIFIC														
7.7	0.2	--	5.9	--	63.5	--	0.1	0.7	2.6	0.1	8.2	88.9		
WESTERN REGIONS														
35.2	3.0	0.5	8.7	0.3	16.8	0.3	1.8	0.6	1.5	*	3.5	72.1		
MAINLAND 48 STATES														
28.9	1.7	0.3	11.3	0.4	21.5	0.4	0.8	0.3	2.9	0.1	2.0	70.6		
ALASKA														
--	--	--	--	--	--	--	--	--	--	--	--	--		
HAWAII														
2.1	--	--	--	--	59.6	--	1.2	2.6	3.5	--	14.8	83.7		
UNITED STATES TOTAL														
28.7	1.7	0.3	11.2	0.4	21.8	0.4	0.8	0.3	2.9	0.1	2.1	70.7		
PUERTO RICO														
21.2	--	--	--	--	51.0	3.0	2.9	0.6	--	--	1.9	80.6		

\* LESS THEN .05 PERCENT.





TABLE 13. AVERAGE INSTALLATION COSTS FOR 18 WATERSHED WORK PLANS DURING FISCAL YEAR 1973,

BY WATER RESOURCE REGIONS										
WATER RESOURCE REGIONS:	NUMBER OF PLANS	FLOODWATER : RETARDING : STRUCTURES : 1/ :	GRADE : STABILIZING : STRUCTURES :	MULTIPLE- : PURPOSE : RESERVOIRS :	CHANNEL : IMPROVE- : MENTS :	ALL : OTHER : STRUCTURES : 2/ :	LAND : TREATMENT : MEASURES :	PROJECT : ADMINIS- : TRATION :	TOTAL : PROJECT : INSTAL- : LATION :	
AVERAGES:		PER STRUCTURE	PER STRUCTURE	PER RESERVOIR	PER MILE	PER PROJECT \$1,000	PER PROJECT	PER PROJECT	PER PROJECT	
NEW ENGLAND	1	585.7	--	357.5	--	--	3,224.5	286.7	7,999.3	
MIDDLE ATLANTIC	1	--	--	--	21.6	159.3	752.3	22.7	953.8	
SOUTH ATLANTIC-GULF	2	138.3	--	354.7	46.8	185.4	363.9	149.5	1,813.0	
GREAT LAKES	--	--	--	--	--	--	--	--	--	
OHIO	1	148.4	--	432.5	--	10.9	307.2	96.7	1,441.3	
TENNESSEE	2	173.2	--	914.4	9.9	17.7	426.0	165.5	2,056.7	
UPPER MISSISSIPPI	--	--	--	--	--	--	--	--	--	
LOWER MISSISSIPPI	2	--	40.5	--	14.4	--	3,429.3	658.1	8,663.1	
EASTERN REGIONS	9	224.1	40.5	420.1	14.5	64.0	1,413.6	261.3	3,940.0	
SOURIS-RED-RAINY	--	--	--	--	--	--	--	--	--	
MISSOURI	5	85.9	27.5	390.0	21.6	319.6	206.4	164.5	1,592.5	
ARKANSAS-WHITE-RED	3	83.1	--	223.6	7.1	79.1	917.8	587.7	3,937.4	
TEXAS-GULF	--	--	--	--	--	--	--	--	--	
RIO GRANDE	--	--	--	--	--	--	--	--	--	
UPPER COLORADO	--	--	--	--	--	--	--	--	--	
LOWER COLORADO	--	--	--	--	--	--	--	--	--	
GREAT BASIN	--	--	--	--	--	--	--	--	--	
COLUMBIA-NO. PACIFIC	--	--	--	--	--	--	--	--	--	
CALIFORNIA-SO. PACIFIC	1	--	--	--	--	600.3	779.8	58.3	1,438.4	
WESTERN REGIONS	9	83.5	27.5	348.4	12.8	270.6	507.3	293.8	2,357.0	
MAINLAND 48 STATES	18	112.1	29.9	399.6	14.5	167.3	960.4	277.6	3,148.5	
ALASKA	--	--	--	--	--	--	--	--	--	
HAWAII	--	--	--	--	--	--	--	--	--	
UNITED STATES	18	112.1	29.9	399.6	14.5	167.3	960.4	277.6	3,148.5	
PUERTO RICO	--	--	--	--	--	--	--	--	--	

1/ INCLUDES STRUCTURES COMBINING FLOODWATER RETENTION WITH GRADE STABILIZATION.

2/ INCLUDES STRUCTURES FOR DIKES AND LEVEES; FLOODWAYS AND DIVERSIONS; DEBRIS BASINS; DRAINAGE, IRRIGATION, M &amp; I WATER, FISH AND WILDLIFE AND BASIC RECREATION FACILITIES; CRITICAL AREA TREATMENTS; MISCELLANEOUS STRUCTURES AND OTHER SINGLE-PURPOSE RESERVOIRS.

TABLE 14. AVERAGE ANNUAL FLOOD DAMAGES PER WATERSHED FOR 18 PLANS APPROVED DURING FISCAL YEAR 1973,

## BY WATER RESOURCE REGIONS

WATER RESOURCE REGIONS:	NUMBER OF PLANS	ALL		FLOODWATER		SEDIMENTATION		ALL		EROSION		INDIRECT		TOTAL DAMAGE
		DAMAGE		DAMAGE		DAMAGE		DAMAGE		DAMAGE		DAMAGE		
----- \$1,000 -----														
NEW ENGLAND	1	131.8	--	--	--	--	--	--	--	--	--	24.3	--	156.2
MIDDLE ATLANTIC	1	11.8	--	--	--	--	--	--	--	--	--	2.0	--	13.8
SOUTH ATLANTIC-GULF	2	57.4	3.3	--	--	--	--	--	--	--	--	5.4	--	66.2
GREAT LAKES	--	--	--	--	--	--	--	--	--	--	--	--	--	--
OHIO	1	34.2	9.0	--	--	--	--	2.5	--	--	--	5.3	--	51.1
TENNESSEE	2	95.9	4.7	--	--	--	--	--	--	--	--	20.2	--	120.8
UPPER MISSISSIPPI	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LOWER MISSISSIPPI	2	690.2	--	--	--	--	--	8.6	--	--	--	--	--	698.8
-----														
EASTERN REGIONS	9	207.2	2.7	--	--	--	--	2.2	--	--	--	9.2	--	221.4
SOURIS-RED-RAINY	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MISSOURI	5	36.8	5.2	--	--	--	--	37.3	--	--	--	6.4	--	85.9
ARKANSAS-WHITE-RED	3	181.4	5.1	--	--	--	--	16.6	--	--	--	20.5	--	223.6
TEXAS-GULF	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RIO GRANDE	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UPPER COLORADO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LOWER COLORADO	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GREAT BASIN	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COLUMBIA-NO. PACIFIC	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CALIFORNIA-SO. PACIFIC:	1	--	--	--	--	--	--	--	--	--	--	--	--	--
-----														
WESTERN REGIONS	9	80.9	4.5	--	--	--	--	26.2	--	--	--	10.4	--	122.2
-----														
MAINLAND 48 STATES	18	144.0	3.7	--	--	--	--	14.2	--	--	--	9.8	--	171.8
ALASKA	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HAWAII	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-----														
UNITED STATES	18	144.0	3.7	--	--	--	--	14.2	--	--	--	9.8	--	171.8
PUERTO RICO	--	--	--	--	--	--	--	--	--	--	--	--	--	--



TABLE 15. AVERAGE ANNUAL BENEFITS PER WATERSHED FOR 18 WORK PLANS APPROVED DURING FISCAL YEAR 1973,

## BY WATER RESOURCE REGIONS

WATER RESOURCE REGION	NUMBER OF PLANS	ALL FLOOD DAMAGE REDUCTION 1/	LAND ENHANCEMENT BENEFITS	DRAINAGE BENEFITS	IRRIGATION BENEFITS	RECREATION BENEFITS 2/	FISH AND WILDLIFE BENEFITS	ALL OTHER WATER MANAGEMENT BENEFITS 3/	TOTAL BENEFITS
									\$1,000
NEW ENGLAND	1	147.7	--	--	--	118.1	--	95.7	450.3
MIDDLE ATLANTIC	1	13.8	1.6	--	--	--	--	3.5	19.0
SOUTH ATLANTIC-GULF GREAT LAKES	2	50.1	33.2	--	--	68.8	--	44.2	200.4
OHIO	--	--	--	--	--	--	--	--	--
TENNESSEE	1	27.9	5.6	--	--	1.9	--	54.3	89.7
UPPER MISSISSIPPI	2	111.2	1.8	--	--	0.4	--	39.9	153.4
LOWER MISSISSIPPI	--	--	--	--	--	--	--	--	--
	2	618.1	65.4	463.0	--	--	--	173.9	1,320.5
EASTERN REGIONS	9	194.2	23.1	102.8	--	28.7	--	74.4	434.2
SOURIS-RED-RAINY MISSOURI	--	--	--	--	--	--	--	--	--
ARKANSAS-WHITE-RED TEXAS-GULF	5	82.4	2.3	4.7	--	35.9	--	10.9	136.4
	3	169.2	17.6	--	--	24.7	--	31.6	243.2
RIO GRANDE	--	--	--	--	--	--	--	--	--
UPPER COLORADO	--	--	--	--	--	--	--	--	--
LOWER COLORADO	--	--	--	--	--	--	--	--	--
GREAT BASIN	--	--	--	--	--	--	--	--	--
COLUMBIA-NO. PACIFIC	--	--	--	--	--	--	--	--	--
CALIFORNIA-SO. PACIFIC	1	--	--	623.6	--	--	--	94.4	718.0
WESTERN REGIONS	9	102.2	7.1	71.9	--	28.2	--	27.1	236.6
MAINLAND 48 STATES	18	148.2	15.1	87.4	--	28.4	--	50.7	335.4
ALASKA	--	--	--	--	--	--	--	--	--
HAWAII	--	--	--	--	--	--	--	--	--
UNITED STATES	18	148.2	15.1	87.4	--	28.4	--	50.7	335.4
PUERTO RICO	--	--	--	--	--	--	--	--	--

1/ INCLUDES FLOOD DAMAGE REDUCTION BENEFITS FROM LAND TREATMENT.

2/ INCLUDES INCIDENTAL RECREATION BENEFITS.

3/ INCLUDES LOCAL SECONDARY AND REDEVELOPMENT BENEFITS.



TABLE 16. ANNUAL FLOOD DAMAGE FOR 1,075 WATERSHED WORK PLANS APPROVED FOR OPERATION THROUGH JUNE 30, 1973,  
BY WATER RESOURCE REGIONS

WATER RESOURCE REGION	TYPE OF DAMAGE													
	: CROP : AND : PASTURE :	: RESTORED : PRODUC- : TIVITY :	: OTHER : AGRICUL- : TURAL :	: NON- : AGRICUL- : TURAL :	: OVERBANK- : DEPOSI- : TION :	: RESER- : VOIR : SEDIMENT :	: OTHER : VOIR : SEDIMENT :	: FLOOD : PLAIN : SCOUR :	: STREAM- : BANK : EROSION :	: GULLY : EROSION : SCOUR :	: IN- : DIRECT : EROSION :	: TOTAL : DAMAGE : DAMAGE :		
													\$1,000	
NEW ENGLAND	69	7	30	2,533	21	31	16	1	--	--	588	3,292		
MIDDLE ATLANTIC	1,267	321	50	2,390	66	8	175	12	29	--	558	4,558		
SOUTH ATLANTIC-GULF	8,811	1,741	584	1,830	315	84	246	63	171	43	937	13,088		
GREAT LAKES	1,345	60	61	198	8	--	32	2	4	--	135	1,787		
OHIO	3,116	95	301	3,537	52	0	60	97	0	2	837	8,006		
TENNESSEE	1,276	246	173	567	67	9	104	71	1	--	286	2,558		
UPPER MISSISSIPPI	1,008	19	112	336	53	5	90	23	35	166	196	2,064		
LOWER MISSISSIPPI	9,593	780	223	564	216	8	231	61	30	28	474	11,438		
EASTERN REGIONS	26,487	3,273	1,538	11,958	801	148	957	333	272	241	4,015	46,795		
SOURIS-RED-RAINY	2,665	31	127	580	--	--	--	2	--	0	274	3,865		
MISSOURI	3,547	156	483	1,621	230	34	152	187	143	3,193	754	10,354		
ARKANSAS-WHITE-RED	9,284	947	1,429	2,673	882	179	84	1,238	7	12	1,477	17,267		
TEXAS-GULF	2,874	263	581	1,019	411	40	3	272	72	0	513	5,789		
RIO GRANDE	2,504	9	111	720	207	12	474	2	0	1	465	4,511		
UPPER COLORADO	26	--	20	16	14	--	23	1	0	--	8	111		
LOWER COLORADO	767	0	253	870	278	--	403	34	3	--	317	2,928		
GREAT BASIN	37	--	18	190	58	25	125	117	--	3	77	652		
COLUMBIA-NO. PACIFIC	761	44	130	840	20	--	10	5	3	0	156	1,927		
CALIFORNIA-SO. PACIFIC	564	--	174	2,806	40	--	307	11	12	24	589	4,687		
WESTERN REGIONS	23,031	1,453	3,330	11,339	2,143	291	1,584	1,873	244	3,235	4,633	52,095		
MAINLAND 48 STATES	49,519	4,727	4,869	23,298	2,945	440	2,542	2,206	516	3,476	8,648	98,891		
ALASKA	--	--	--	--	--	--	--	--	--	--	--	--		
HAWAII	84	--	18	561	--	--	44	52	2	29	134	926		
UNITED STATES	49,603	4,727	4,887	23,860	2,945	440	2,586	2,258	519	3,505	8,782	99,817		
PUERTO RICO	912	--	--	61	--	--	103	--	--	--	124	1,201		

1/ INCLUDED IN CROP AND PASTURE DAMAGE.

2/ INCLUDES DOWNSTREAM EROSION, OFF PROJECT.



TABLE 17. ANNUAL BENEFITS FROM STRUCTURAL MEASURES INCLUDED IN 1,075 WORK PLANS THROUGH JUNE 30, 1973,  
BY WATER RESOURCE REGIONS - PART 2

WATER RESOURCE REGION	MUNICIPAL AND INDUSTRIAL WATER SUPPLY	RECREATION	INCIDENTAL	OFF PROJECT	REDEVELOPMENT	LOCAL SECONDARY	TOTAL ALL STRUCTURES
							\$1,000
NEW ENGLAND	78	1,305	2	--	177	352	4,952
MIDDLE ATLANTIC	687	4,191	43	--	110	860	12,218
SOUTH ATLANTIC-GULF	611	4,273	481	61	1,013	2,107	26,044
GREAT LAKES	--	1,535	--	--	17	440	5,204
OHIO	377	4,731	100	154	685	1,076	15,595
TENNESSEE	56	59	19	13	166	126	2,942
UPPER MISSISSIPPI	285	1,331	67	58	--	374	4,883
LOWER MISSISSIPPI	2	630	82	71	312	1,730	19,449
EASTERN REGIONS	2,099	18,058	795	358	2,482	7,067	91,289
SOURIS-RED-RAINY	--	91	--	--	--	121	3,161
MISSOURI	87	1,330	43	303	26	669	11,996
ARKANSAS-WHITE-RED	1,088	1,966	403	737	667	1,489	21,844
TEXAS-GULF	99	157	527	238	41	335	6,847
RIO GRANDE	--	22	--	15	93	121	6,485
UPPER COLORADO	--	--	1	--	4	83	785
LOWER COLORADO	--	--	--	304	--	112	3,119
GREAT BASIN	4	48	40	--	31	108	1,553
COLUMBIA-NO. PACIFIC	631	930	--	--	--	660	6,829
CALIFORNIA-SO. PACIFIC	82	779	--	--	--	846	9,492
WESTERN REGIONS	1,992	5,326	1,020	1,599	864	4,549	72,116
MAINLAND 48 STATES	4,092	23,384	1,816	1,957	3,347	11,617	163,405
ALASKA	--	--	--	--	--	--	--
HAWAII	--	144	--	--	--	45	1,101
UNITED STATES	4,092	23,529	1,816	1,957	3,347	11,663	164,506
PUERTO RICO	--	--	--	--	--	--	1,830

3/ RECREATION BENEFITS FROM WATER STORED FOR OTHER PURPOSES.

4/ REDUCTION IN FLOOD DAMAGES BELOW AUTHORIZED WATERSHED AREAS.







UNITED STATES DEPARTMENT OF AGRICULTURE  
WASHINGTON, D. C. 20250

OFFICIAL BUSINESS  
PENALTY FOR PRIVATE USE, \$300

